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REMARKS

Applicant appreciates the continued thorough examination of the present application that is reflected in the non-final Official action of March 30, 2004. Applicant also appreciates the continued indication that Claims 7-18 and 25-36 are allowed, and that Claims 4-6 and 22-24 would be allowable if rewritten in independent form. As was the case in Applicant's response of September 26, 2003 to the third, nonfinal Official Action of August 13, 2003, it would be a simple matter to rewrite the objected to claims in independent form and cancel the rejected claims. However, upon careful analysis, Applicant respectfully submits that Claims 1-3 and 19-21 are not obvious over U.S. Patent 6,249,518 to Cui (hereinafter "Cui") in view of U.S. Patent 6,144,710 to Chen et al. (hereinafter "Chen"). Accordingly, Applicant respectfully requests reconsideration of the outstanding rejections for the reasons that will be described below.

Claims 1, 3, 19, and 21 Are Patentable Over the Combination of Cui and Chen

Claims 1, 3, 19, and 21 stand rejected under 35 USC § 103(a) as being unpatentable over Cui in view of Chen. Applicants respectfully submit, however, that it would not be obvious to combine the teachings of the cited references.

For example, Claim 1 recites:

1. A method of receiving a signal in the presence of noise and interference comprising the steps of:
demodulating the signal when a relationship between the signal and the noise and the interference meets a criterion; and
jointly demodulating the signal when the relationship between the signal and the noise and the interference does not meet the criterion. (Emphasis added.)

Thus, Claim 1 recites that the received signal is demodulated when the relationship between the signal, noise, and interference meets one criterion, but is jointly demodulated when the relationship between the signal, noise, and interference does not meet the criterion. As defined in the present application at Page 1, lines 6-9:

Joint demodulation is widely used to detect a desired signal from a received signal that includes an interfering signal as well. In joint demodulation, the desired signal and the interfering signal are both demodulated based on information concerning the desired signal and the interfering signal, so as to obtain a better estimate of the desired signal. (Emphasis added.)

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The Official Action concedes that Cui does not disclose joint demodulation, and relies on Chen to supply the missing recitations. *See* Official Action, pp. 3-4. As motivation for the combination, the Official Action states that "it would have been obvious to one skilled in the art at the time of the invention to demodulate both the desired signal and the interference signal in Cui's SA-CCIC demodulator for the purpose of receiving signals with a low bit error rates by implementing a Fobenius norm, which takes the difference between the received signal and the actual received signal resulting in minimizing the node metric in the Viterbi algorithm, as taught by Chen." *See* Official Action, p. 4.

However, Applicant respectfully submits that to establish a *prima facie* case of obviousness, three basic criteria must be met. The prior art reference or references when combined must teach or suggest *all* the claim limitations. There must be some suggestion or motivation, either in the references themselves or in the knowledge generally available to one of ordinary skill in the art, to modify the reference or to combine reference teachings, and there must be a reasonable expectation of success of the combination. The teaching or suggestion to make the claimed combination and the reasonable expectation of success must both be found *in the prior art*, not in applicant's disclosure. *See* MPEP § 2143. As affirmed by the Court of Appeals for the Federal Circuit, to support combining references in a § 103 rejection, evidence of a suggestion, teaching, or motivation to combine must be *clear and particular*, and this requirement is not met by merely offering broad, conclusory statements about teachings of references. *In re Dembiczak*, 50 USPQ2.d 1614, 1617 (Fed. Cir. 1999).

Applicant submits that the cited references contain no suggestion or motivation for their combination, and that the stated motivation to combine is insufficient. While both Cui and Chen may relate to co-channel interference (CCI), Cui describes an SA-CCIC demodulator, which demodulates only the desired information signal. The interfering signal is not demodulated, but is fed-back into the least square estimator in order to better estimate the information signal. *See* Cui, Fig. 5. The disclosure of Cui contains no mention of a Fobenius norm or a Viterbi algorithm. As such, it would not be obvious to modify the SA-CCIC demodulator of Cui to demodulate both the desired signal and the interfering signal by implementing the Fobenius norm and/or the Viterbi algorithm of Chen, as demodulating the interfering signal would appear to provide no operational benefit to the demodulator of Cui. In other words, such a step would appear to be of no use to Cui's SA-CCIC demodulator in

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better estimating the information signal. Thus, the stated motivation for the combination of Cui and Chen is not "clear and particular," as required by the case law cited above.

In view of the above, Applicant respectfully submits that one of skill in the art would not be motivated to combine the teachings of Cui and Chen. For at least these reasons, Claim 1 is patentable under Section 103(a). Claim 3 is patentable at least per the patentability of Claim 1 from which it depends. Claims 19 and 21 are system analogs of Claims 1 and 3, and are patentable for the same reasons that were described above.

Claims 2 and 20 Are Patentable Over the Combination of Cui and Chen

Claims 2 and 20 also stand rejected under 35 USC § 103(a) as being unpatentable over Cui in view of Chen. As an initial matter, Applicant respectfully submits that Claims 2 and 20 are patentable for at least the reasons discussed above with respect to Claims 1 and 19 from which they respectively depend. In addition, Applicant submits that the cited references do not disclose or suggest all of the recitations of Claim 2.

In particular, Claim 2 recites:

2. A method according to Claim 1 wherein the criterion is a first criterion and wherein the step of jointly demodulating comprises the steps of:
demodulating the signal if a relationship between the noise and the interference meets a second criterion; and
jointly demodulating the signal if the relationship between the noise and the interference does not meet the second criterion. (Emphasis added.)

Thus, Claim 2 recites that the received signal is demodulated when the relationship between the noise and interference meets a second criterion, but is jointly demodulated when the relationship between the noise and interference does not meet the second criterion. Further, the choice of demodulation is based on the first criterion of Claim 1 in combination with the second criterion of Claim 2. See Specification, Fig. 6 and Page 8, lines 17-20.

The Official Action states that "[o]ne skilled in the art may consider the criterion to be a first criterion or a second criterion, wherein the first and second criterion may be the same criterion." See Official Action, p. 4. The Official Action further states that, because Cui teaches a signal to noise and interference relationship, "one skilled in the art may analyze that the interference, which is extracted from the signal, uses the same criterion, which includes the relationship between noise and interference." See Official Action, p. 5.

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Applicant submits the Examiner may have misunderstood that the first criterion is based on the relationship between the signal and the noise and the interference, while the second criterion is based on the relationship between the interference and the noise. Thus, the first criterion is not the same as the second criterion. For example, as defined in the present specification, "the carrier-to-interference-and noise ratio, $C/(I+N)$...is an estimate of the desired signal strength relative to the combined strength of the noise plus interfering signals." *See Specification, Page 5, lines 7-9.* Moreover, "an interference-to-noise ratio (I/N)...may be used, along with the $C/(I+N)$ estimate, to determine whether demodulation or joint demodulation is to be performed and subsequently selected." *See Specification, Page 5, lines 14-19.* As the $C/(I+N)$ ratio is not the same as the I/N ratio, the first criterion (based on $C/(I+N)$) cannot be the same as the second criterion (based on I/N).

As such, Applicant submits that the combination of Cui and Chen does not disclose or suggest many of the recitations of Claim 2. For example, although Cui may describe choosing conventional or SA-CCIC demodulation based on the relationship between the signal and the noise and the interference, Cui does not appear to disclose determining the choice of demodulation based on the relationship between noise and interference, as recited by Claim 2. Further, the Official Action does not point to Chen for such a recitation.

In addition, Cui does not appear to disclose a choice of demodulation based on both a first criterion (the relationship between the signal and the noise and the interference) in combination with a second criterion (the relationship between interference and noise), as recited in Claim 2 and discussed above. *See also Specification, Fig. 6 and Page 8, lines 12-20.* The Official Action concedes as much in its reasons for the indication of allowable subject matter, stating that "Cui does not teach a second criterion, which is different from a first criterion, to further determine which demodulator is to be implemented in the receiver." *See Official Action, p. 6.* Nor does Chen appear to supply the missing recitations.

Thus, the combination of Cui and Chen does not disclose or suggest all of the recitations of Claim 2. If the Examiner wishes to maintain the rejections based on Cui and Chen, Applicant respectfully requests that the Examiner please point out the specific portions of the cited references that disclose the choice of standard or joint demodulation based on a relationship between interference and noise, as well as specific portions of the cited references that disclose the use of a first criterion and a second criterion to determine the choice of demodulation.

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For at least the reasons described above, Applicant respectfully submits that Claim 2 is patentable over the cited references under Section 103(a). Claim 20 is a system analog of Claim 2, and is patentable for the same reasons that were described above.

Conclusion

Applicant again wishes to thank the Examiner for the continued thorough examination and for the continued indication that all but six of the claims are allowable. As shown above, however, these six claims are patentable over the combination of the cited references. Accordingly, Applicant respectfully requests reconsideration of the outstanding rejections and allowance of the present application.

Respectfully submitted,



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